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09/576,038

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Mark Sean Hefty

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EXAMINER

NGUYEN, THANH T

ART UNIT

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2144

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|---------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 09/576,038 | Applicant(s) HEFTY ET AL. | |
| | Examiner Thanh Tammy Nguyen | Art Unit 2144 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE (3) MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on May 9, 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 32-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 32-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |



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Detailed Office Action

1. The Office action of May 9, 2008 is withdrawn and the following action is taken.
2. Claims 31-56 have been examined.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. *Claims 32-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beshai et al., (hereinafter Beshai) U.S. Patent No. 6,721,271 in view of Massa et al., (hereinafter Massa) U.S. Patent No. 6,658,469 further in view of Phil Edholm., (hereinafter Edholm) U.S. Patent No. 6,600,72, further in view of Beckett et al., (hereinafter Beckett) U.S. Patent No. 6,724,896.*
5. As to claims 32, Beshai discloses the invention substantially as claimed, Beshai teaches including a method comprising: if an amount of data located in

a first memory buffer in a local system does not exceed a maximum transfer side for a single memory to memory [see col. 12, lines 26-40 (the number segments in the buffer equal or exceeds the parcel size)] associating the data with a first transfer operation (see col. 14, line 65 to col. 15, line 28); and if the amount of data associated with the first transfer operation has not reached the maximum transfer capacity, associating data for the RDMA request located in one or more portions of one or more other memory buffers with the first transfer operation (see col. 18, lines 9-35). But Beshai does not explicitly disclose transfer operation over a data network to a remote memory in a remote system with other memory buffers in the local system associated with a remote direct memory access (RDMA) request.

6. In the same field of endeavor, Massa discloses (e.g., method and system for switching between network transport providers). Massa discloses transfer operation to a remote memory in a remote system with other memory buffers in the local system [see fig.5 of Massa and col. 13, lines 30-63] (SAN provider supports transferring data directly from a remote buffer to a specified local buffer through RDMA read operations).
7. Accordingly, It would have been obvious to one of ordinary skill in the networking art at the time of the invention was made to have incorporated Massa's teaching of method and system for switching between network transport providers with the teaching of Beshai to have transferring operation to a remote memory in a remote system with other memory buffers in the local system for the purpose of maximizing the communication bandwidth and

minimizing the communication latency observed by the communicating applications[see Massa col.3, line 66 to col.4, line 2]. However, Beshai and Massa do not explicitly teach data is to be transferred in a single transfer operation to a remote memory buffer.

8. In the same field of endeavor, Edholm discloses (e.g., end node pacing for QOS and bandwidth management). Edholm discloses data is to be transferred in a single transfer operation to a remote memory buffer [see Edholm col.4, lines 4-15 (transfer the packet to a memory buffer)].
9. Accordingly, It would have been obvious to one of ordinary skill in the networking art at the time of the invention was made to have incorporated Edholm's teaching of end node pacing for QOS and bandwidth management with the teaching of Beshai for the purpose of provide to increase the complexity and expense of the network system [see Edholm col. 1, lines 45-50]. Thus, Beshai provides the motivation by stating providing for transfer to be simpler, and therefore faster and easier to scale up [see Beshai, col.4, lines 39-40]. Also, Beshia, Massa and Edholm do not explicitly disclose associating a portion of the data associated with a subsequent transfer operation for the request.
10. In the same filed of endeavor, Beckett discloses (e.g., Event-Driven Servers for Data Extraction and merge for EDI transaction processing using the internet) Beckett discloses associating a portion of the data associated with a subsequent transfer operation for the request [col.4, lines 32-26, col.5, lines 50-63].

11. Accordingly, It would have been obvious to one of ordinary skill in the networking art at the time of the invention was made to have incorporated Colgate's teaching of Event-Driven Servers for Data Extraction and merge for EDI transaction processing using the internet with the teaching of Beshai to have associating a portion of the data associated with a subsequent transfer operation for the request for the purpose of reducing costs and data transfers are performed via a third party communication partner [col.1, lines 30-35].
12. As to claim 33, Beshai teaches the invention as claimed, additionally comprising transferring the data associated with the first transfer operation (see abstract).
13. As to claim 34, Beshai teaches the invention as claimed, additionally comprising associating a descriptor with the first transfer operation (see col. 10, lines 48-65), and the description to specify the remote memory buffer to which the data is to be transferred and to indicate a portion of data remaining to be transferred for the RDMA request.
14. As to claim 35, Beshai teaches the invention as claimed, additionally comprising associating data with one or more subsequent transfer operations (see col. 17, lines 18- 51).
15. As to claim 36, Beshai teaches the invention as claimed, wherein the first and one or more subsequent transfer Operations are performed in response to one or more RDMA (Remote Direct Memory Access) requests (see fig. 16 memory 0).

Art Unit: 2144

16. As to claim 37, Beshai teaches the invention as claimed, additionally comprising: if the amount of data located in the first memory buffer exceeds the maximum transfer size: associating a portion of the data with the first transfer operation: and associating one or more subsequent portions of the data with one or more subsequent transfer operations (see col. 17, lines 1-67).
17. As to claim 38, Beshai teaches the invention as claimed, additionally comprising: associating a descriptor with the first transfer operation; and transferring the data associated with the first transfer operation (see abstract), the description to specify the remote memory buffer to which the data is to be transferred and to indicate a portion of data remaining to be transferred for the RDMA request.
18. As to claim 39, Beshai teaches the invention as claimed, additionally Comprising: associating a descriptor with each of the one or more subsequent transfer operations; and transferring the data associated with the one or more subsequent transfer operations (see col. 17, lines 1-67).
19. As to claim 40, Beshai discloses the invention substantially as claimed, Beshai teaches teach including an apparatus comprising: an RDMA (remote direct memory access) manager operable to service one or more RDMA requests (see Fig. 1), and to: determine if an amount of data looted in a first memory buffer exceeds a maximum transfer size [see col. 12, lines 26-40 (the number segments in the buffer equal or exceeds the parcel size)], and: if it is determined that the amount of data located in a first memory buffer does not exceed the maximum transfer size [see col. 12, lines 26-40 (the number

segments in the buffer equal or exceeds the parcel size)], then associate the data with a first transfer operation (see col.14, line 65 to col.15, line 28); and if the amount of data associated with the first transfer operation has not reached the maximum transfer size, associate data located in one or more portions of one or more other memory buffers with the first transfer operation (see col. 18, lines 9-35). But Beshai does not explicitly disclose transfer operation to a remote memory in a remote system with other memory buffers in the local system.

20. In the same field of endeavor, Massa discloses (e.g., method and system for switching between network transport providers). Massa discloses transfer operation to a remote memory in a remote system with other memory buffers in the local system [see fig.5, col. 13, lines 30-63] (SAN provider supports transferring data directly from a remote buffer to a specified local buffer through RDMA read operations).
21. Accordingly, It would have been obvious to one of ordinary skill in the networking art at the time of the invention was made to have incorporated Massa's teaching of method and system for switching between network transport providers with the teaching of Beshai to have transferring operation to a remote memory in a remote system with other memory buffers in the local system for the purpose of maximizing the communication bandwidth and minimizing the communication latency observed by the communicating applications[see Massa col.3, line 66 to col.4, line 2]. However, Beshai does

Art Unit: 2144

not explicitly teach data is to be transferred' in a single transfer operation to a remote memory buffer.

22. In the same field of endeavor, Edholm discloses (e.g., end node pacing for QOS and bandwidth management). Edholm discloses data is to be transferred in a single transfer operation to a remote memory buffer [see Edholm col.4, lines 4-15 (transfer the packet to a memory buffer)].
23. Accordingly, It would have been obvious to one of ordinary skill in the networking art at the time of the invention was made to have incorporated Edholm's teaching of end node pacing for QOS and bandwidth management with the teaching of Beshai for the purpose of provide to increase the complexity and expense of the network system [see Edholm col. 1, lines 45-50]. Thus, Beshai provides the motivation by stating providing for transfer to be simpler, and therefore faster and easier to scale up [see Beshai, col.4, lines 39-40]. Also, Beshia, Massa and Edholm do not explicitly disclose associating a portion of the data associated with a subsequent transfer operation for the request.
24. In the same field of endeavor, Beckett discloses (e.g., Event-Driven Servers for Data Extraction and merge for EDI transaction processing using the internet). Beckett discloses associating a portion of the data associated with a subsequent transfer operation for the request [col.4, lines 32-26, col.5, lines 50-63].
25. Accordingly, It would have been obvious to one of ordinary skill in the networking art at the time of the invention was made to have incorporated

Art Unit: 2144

Colgate's teaching of Event-Driven Servers for Data Extraction and merge for EDI transaction processing using the internet with the teaching of Beshai to have associating a portion of the data associated with a subsequent transfer operation for the request for the purpose of reducing costs and data transfers are performed via a third party communication partner [col.1, lines 30-35].

26. As to claim 41, Beshai teaches the invention as claimed, the RDMA manager additionally operable to transfer the data associated with the first transfer operation (see abstract).
27. As to claim 42, Beshai teaches the invention as claimed, the RDMA manager additionally operable to associate data with one or more subsequent transfer operations (see col. 17, lines 1-67).
28. As to claim 43, Beshai teaches the invention as Claimed, the RDMA manager additionally operable to: determine if the amount of data located in the first memory buffer exceeds the maximum transfer size, and: if the amount of data located in the first memory buffer exceeds the maximum transfer size: associate a portion of the data and a descriptor with the first transfer operation; and associate one or more subsequent, portions of the data with one or more subsequent transfer operations (see fig. 17), the description to specify the remote memory buffer to which the data is to be transferred and to indicate a portion of data remaining to be transferred for the RDMA request.
29. Claim 48 has similar limitations as claim 32; therefore, it is rejected under the same rationale.

Art Unit: 2144

30. Claim 53 has similar limitations as claim 43; therefore, it is rejected under the same rationale.
31. Claims 49-52 have similar limitations as claims 33-36; therefore, they are rejected under the same rationale.
32. Claims 54, and 55 have similar limitations as claims 38, and 39; therefore, they are rejected under the same rationale.
33. *Claims 44-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beshai et al., (hereinafter Beshai) U.S. Patent No. 6,721,271, in view of Massa et al., (hereinafter Massa) U.S. Patent No. 6,658,469 in view of Phil Edholm., (hereinafter Edholm) U.S. Patent No. 6,600,721 further in view of Mauger et al., (hereinafter Mauger) U.S. Patent No. 6,917,586, further in view of Beckett et al., (hereinafter Beckett) U.S. Patent No. 6,724,896.*
34. As to claim 44, Beshai discloses the invention substantially as claimed, Beshai teach including a system comprising: a host fabric adapter; and an RDMA (remote direct memory access) manager included in a software stack of the host fabric adapter, the RDMA manager operable to service one or more RDMA requests (see fig. 16), and to: determine if an amount of data located in a first memory buffer exceeds a maximum transfer size [see col. 12, lines 26-40 (the number segments in the buffer equal or exceeds the parcel size)] and; if it is determined that the amount of data located in the first memory buffer does not exceed the maximum transfer size, then associate the

data with a first transfer operation (see col. 14, line 65 to col. 15, line 28.): and if the amount of data associated with the first transfer operation has not reached the maximum transfer size, associate data located in one or more portions of one or more other memory buffers of the plurality of memory buffers with the first transfer operation (see col. 18, lines 9-35, and col. 13, lines 9-17). But Beshai does not explicitly disclose transfer operation to a remote memory in a remote system with other memory buffers in the local system. 36. In the same field of endeavor, Massa discloses (e.g., method and system for switching between network transport providers). Massa discloses transfer operation to a remote memory in a remote system with other memory buffers in the local system [see fig.5 of Massa and col. 13, lines 30-63] (SAN provider supports transferring data directly from a remote buffer to a specified local buffer through RDMA read operations).

35. Accordingly, It would have been obvious to one of ordinary skill in the networking art at the time of the invention was made to have incorporated Massa's teaching of method and system for switching between network transport providers with the teaching of Beshai to have transferring operation to a remote memory in a remote system with other memory buffers in the local system for the purpose of maximizing the communication bandwidth and minimizing the communication latency observed by the communicating applications[see Massa col.3, line 66 to col.4, line 2]. But Beshai, and Massa do not explicitly teach fabric adapter. However, Mauger teaches fabric adapter (fig.3) (see 8, line 58 to col.9, line 35). It would have been obvious to one of

ordinary skill in the art at the time of the invention was made to implement the teachings of Mauger into the computer system of Beshai to have fabric adapter because it would have an efficient system that can provide specific functions that enable any-server-to-any-storage device connectivity through the use of Fibre Channel switching technology. However, Beshai, Massa, and Beshai do not explicitly teach data is to be transferred in a single transfer operation to a remote memory buffer. 38. In the same field of endeavor, Edholm discloses (e.g., end node pacing for QOS and bandwidth management). Edholm discloses data is to be transferred in a single transfer operation to a remote memory buffer [see Edholm col.4, lines 4-15 (transfer the packet to a memory buffer)].

36. Accordingly, It would have been obvious to one of ordinary skill in the networking art at the time of the invention was made to have incorporated Edholm's teaching of end node pacing for QOS and bandwidth management with the teaching of Beshai for the purpose of provide to increase the complexity and expense of the network system [see Edholm col. 1, lines 45-50]. Thus, Beshai provides the motivation by stating providing for transfer to be simpler, and therefore faster and easier to scale up [see Beshai, col.4, lines 39-40]. Also, Beshia, Massa, Edholm, and Mauger do not explicitly disclose associating a portion of the data associated with a subsequent transfer operation for the request.

37. In the same filed of endeavor, Beckett discloses (e.g., Event-Driven Servers for Data Extraction and merge for EDI transaction processing using the

Art Unit: 2144

internet) Beckett discloses associating a portion of the data associated with a subsequent transfer operation for the request [col.4, lines 32-26, col.5, lines 50-63].

38. Accordingly, It would have been obvious to one of ordinary skill in the networking art at the time of the invention was made to have incorporated Colgate's teaching of Event-Driven Servers for Data Extraction and merge for EDI transaction processing using the internet with the teaching of Beshai to have associating a portion of the data associated with a subsequent transfer operation for the request for the purpose of reducing costs and data transfers are performed via a third party communication partner [col.1, lines 30-35].
39. Claim 45 has similar limitations as claim 41; therefore, it is rejected under the same rationale.
40. Claim 46 has similar limitations as claim 42; therefore, it is rejected under the same rationale.
41. Claim 47 has similar limitations as claim 43; therefore, it is rejected under the same rationale.
42. *Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beshai et al., (hereinafter Beshai) U.S. Patent No. 6,721,271, in view of Massa et al., (hereinafter Massa) U.S. Patent No. 6,658,469 in view of Phil Edholm., (hereinafter Edholm) U.S. Patent No. 6,600,721 further in view of Landy Wang., (hereinafter Wang) U.S. Patent No. 6,477, further in view of Beckett et al., (hereinafter Beckett) U.S. Patent No. 6,724,896.*

Art Unit: 2144

43. As to claim 56, Beshai does not explicitly disclose the method of claim 32, wherein the RDMA request is received via single function call.
44. In the same field of endeavor, Wang discloses (e.g., providing access to physical memory allocated to a process by selectively mapping pages of the physical memory with virtual memory allocated to the process). Wang discloses the RDMA request is received via single function call [see col.17, 23-27] (configured with a set of function calls to receive the allocation request for virtual memory, the allocation request).
45. Accordingly, It would have been obvious to one of ordinary skill in the networking art at the time of the invention was made to have incorporated Wang's teaching of Providing access to physical memory allocated to a process by selectively mapping pages of the physical memory with virtual memory allocated to the process with the teaching of Beshai to have the RDMA request is received via single function call, for the purpose of improved performance, and enabling access to larger amounts of memory via a virtual address, essentially by adjusting a pointer in a straightforward manner, and without copying of the data [see col.2 Lines 52-57]. Also, Beshia, Massa, Edholm, and Wang do not explicitly disclose the portion of data corresponding to an amount of data that when added with the amount of data in the first memory buffer does not exceed the maximum transfer size.
46. In the same filed of endeavor, Beckett discloses (associating a portion of the data associated with a subsequent transfer operation for the request [col.4, lines 32-26, col.5, lines 50-63].

47. Accordingly, It would have been obvious to one of ordinary skill in the networking art at the time of the invention was made to have incorporated Colgate's teaching of Event-Driven Servers for Data Extraction and merge for EDI transaction processing using the internet with the teaching of Beshai to have associating a portion of the data associated with a subsequent transfer operation for the request for the purpose of reducing costs and data transfers are performed via a third party communication partner [col.1, lines 30-35].

Conclusion

48. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tammy T. Nguyen whose telephone number is 571-272- 3929. The examiner can normally be reached on Monday - Friday 8:30 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ***William Vaughn*** can be reached on 571-272-3922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the

Art Unit: 2144

Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thanh Tammy Nguyen/

Thanh Tammy Nguyen

Primary Examiner, Art Unit 2144